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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/725,165	11/29/2000	Jose Geraldo Furtado Ramos	2764-34	8558
23117	7590	06/01/2006		
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			EXAMINER LEUNG, JENNIFER A	
			ART UNIT	PAPER NUMBER
			1764	
DATE MAILED: 06/01/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/725,165	Applicant(s) RAMOS ET AL.	
	Examiner Jennifer A. Leung	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2006.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-6 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1 and 3-6 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Appeal Brief

1. Applicant's appeal brief submitted on March 16, 2006 has been received and carefully considered. Applicant's arguments against the finality of the rejection of the last Office action are persuasive and, therefore, the finality of that action is withdrawn.
2. Claim 2 is cancelled. Claims 1 and 3-6 are currently under consideration.

Claim Analysis

3. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

In the instant case, **HOWEVER**, the secondary cyclone and the primary cyclone structures recited in the preamble have been construed to limit the structure of the termination system being defined by the body of the claim. The secondary cyclone and the primary cyclone structures are hence treated as claim limitations. The basis for this determination is found at MPEP section 2111.02, a portion of which is set forth below:

I. PREAMBLE STATEMENTS LIMITING STRUCTURE

Any terminology in the preamble that limits the structure of the claimed invention must be treated as a claim limitation. See, e.g., *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1257, 9 USPQ2d 1962, 1966 (Fed. Cir. 1989) (The determination of whether preamble recitations are structural limitations can be resolved only on review of the entirety of the application "to gain an understanding of what the inventors actually invented and intended to encompass by the claim."); *Pac-Tec Inc. v. Amerace Corp.*, 903 F.2d 796, 801, 14 USPQ2d

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1871, 1876 (Fed. Cir. 1990) (determining that preamble language that constitutes a structural limitation is actually part of the claimed invention). *In re Stencel*, 828 F.2d 751, 4 USPQ2d 1071 (Fed. Cir. 1987). (The claim at issue was directed to a driver for setting a joint of a threaded collar; however, the body of the claim did not directly include the structure of the collar as part of the claimed article. The examiner did not consider the preamble, which did set forth the structure of the collar, as limiting the claim. The court found that the collar structure could not be ignored. While the claim was not directly limited to the collar, the collar structure recited in the preamble did limit the structure of the driver: "[T]he framework - the teachings of the prior art - against which patentability is measured is not all drivers broadly, but drivers suitable for use in combination with this collar, for the claims are so limited." *Id.* at 1073, 828 F.2d at 754.).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Braun et al. (US 5,079,379) in view of Jones (US 2,634,191).

Braun et al. (FIG. 1; column 2, lines 42-58) discloses an apparatus comprising a primary cyclone (i.e., first cyclone **20**) and a secondary cyclone (i.e., second cyclone **25**), wherein each cyclone comprises a leg (i.e., a bottom exit **23**) that terminates distally in a radius-curved termination (see FIG. 1) that is immersed in a fluidized bed of particles (i.e., bed **10** of mixed catalyst and inert particles) and is devoid of movable sealing parts (i.e., no movable sealing parts are disclosed or illustrated by Braun et al.).

Braun et al. is silent as to the individual legs of the primary and secondary cyclones **20,25** being joined together at a cyclone separator leg to form a single primary and secondary cyclone leg complex where solids collected by both cyclones **20,25** are combined.

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Jones (column 1, lines 35-48; with emphasis added) teaches that,

“Solids removed from the effluent gases by the cyclones are returned through a pipe to the fluid bed. The pipe, commonly called a “dip-leg,” extends below the surface of the bed in order to provide a seal against gases which might otherwise be blown upwardly in the dip-leg and prevent proper action of the cyclone. *Various arrangements of cyclones and dip-legs are in use. In some installations cyclones in multiple are used discharging solids into a common dip-leg. In others, cyclones in series, or series-parallel, are used with individual dip-legs.*”

It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the apparatus of Braun et al. such that the legs of the primary and secondary cyclones 20,25 were joined together at a cyclone separator leg to form a single primary and secondary cyclone leg complex, on the basis of suitability for the intended use and absent showing any unexpected results thereof, because the provision of a single, common dip-leg for the discharge of solids from cyclones in multiple is a conventional cyclone configuration in the art, as evidenced by Jones, above.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Braun et al. (US 5,079,379) in view of Jones (US 2,634,191), as applied to claim 1 above, and further in view of Danielsen et al. (U.S. 4,996,028).

The collective teaching of Braun et al. and Jones is silent as to the specifically recited ratio of radius-to-diameter for the single leg termination. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select a ratio of 1.0 to 3.0 for the ratio of radius-to-diameter for the single leg termination in the modified apparatus of Braun et al., since the specific ratio is not considered to confer patentability to the

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claim since the precise ratio would have been considered a result effective variable by one having ordinary skill in the art. Accordingly, one having ordinary skill in the art would have routinely optimized the ratio of radius-to-diameter in order to obtain a desired solids level within the cyclone diplegs, *In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980), and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Danielson et al. is further provided to evidence the conventionality of providing a single leg termination to the distal end of a cyclone dipleg according to the recited configuration, wherein, "... the radius of curvature of the tubular body portion 25 preferably is in the range of from *about 1 1/2 times to about 2 1/2 times* the diameter of the tubular body portion 25." Maintaining a pre-determined, sufficient, radius of curvature increases, under conditions of use, the stability of the dipleg solids level over that of diplegs having straight run tubular body portions, as taught by Danielson. (column 3, lines 2-10; FIG. 1-2).

6. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Braun et al. (US 5,079,379) in view of Jones (US 2,634,191), as applied to claim 1 above, and further in view of Luckenbach (U.S. 4,074,691).

Regarding claim 4, Braun is silent as to the radius curve termination of the cyclone leg (see FIG. 1) being constructed from a succession of straight tube sections arranged in an arcuate array. In any event, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select such a construction for the radius curve termination in the modified apparatus of Braun et al., on the basis of suitability for the intended use and absent showing any unexpected results thereof, because the substitution of known

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equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). To evidence the conventionality of such a leg termination construction, Luckenbach (FIG. 1) teaches a cyclone comprising a dipleg 16 having a leg termination constructed of a pair of interconnected angularly disposed conduit members 12 and 14, the upper one of which is lineal and connected with the lower vertical portion of the cyclone dipleg 16.

Regarding claim 5, as seen in FIG. 1 of Braun et al., the radius curve at the end of the cyclone leg inherently directs the flow of descending mass of solids into a plane orthogonal to the ascending gaseous flow, by virtue of the total angle subtended by the radius curve.

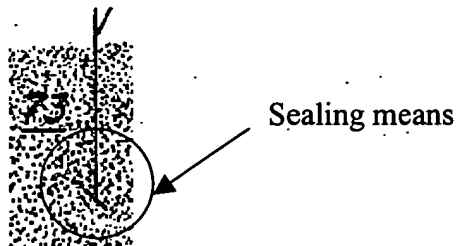
7. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Owen et al. (US 3,821,103) in view of Jones (US 2,634,191).

Regarding claim 1, Owen et al. (FIG. 1; column 3, line 65 to column 4, line 30; column 5, lines 19-35) discloses an apparatus comprising a primary cyclone 65 and a secondary cyclone 67, wherein a cyclone separator leg joins the lower end of the leg 69 of the secondary cyclone 67 and the leg 71 of the primary cyclone 65 to form a single primary and secondary cyclone leg complex where solids collected by both cyclones are combined (see FIG. 1), the termination of the cyclone separator leg being immersed in a fluidized bed of particles 73.

Owen et al. is silent as to the cyclone separator leg terminating distally in a radius-curved single leg termination that is devoid of movable sealing parts. (Although not specifically described by Owen et al., it appears from the illustration of FIG. 1 that the cyclone separator leg does, however, terminate distally with *some* sort of dip-leg sealing arrangement. The Examiner

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takes Official Notice that such illustration, inserted below, is commonly used in the art to suggest dip-leg sealing arrangements).



Jones (FIG. 1) teaches a cyclone separator leg (i.e., dip-leg 16) terminating distally in a radius curved termination (i.e., bend 20) that is devoid of movable sealing parts (i.e., During normal operation, the dip-leg 16 is open at its lower end and thus devoid of movable sealing parts. The seals taught by Jones are only present during the loading of the vessel or start-up. *In particular*, Jones teaches a seal wherein, “the seal itself may be composed either partly or wholly of material which will fuse or otherwise rupture or disintegrate at the desired temperature [during normal operation].” See column 2, lines 49-55; and generally, column 2, lines 24-55).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the cyclone separator leg in the apparatus of Owen et al. such that the leg terminated distally in a radius curved single leg termination that was devoid of movable sealing parts, on the basis of suitability for the intended use and absent showing any unexpected results thereof, because the radius curve acts as a baffle against bubbles of air rising through the catalyst bed, as taught by Jones (column 4, lines 36-39).

Regarding claim 6, as shown in FIG. 1 of Owen et al., the junction of the leg 71 of the primary cyclone 65 and the leg 69 of the secondary cyclone 67 lies on the side opposite a distal end of the cyclone leg termination and higher than the distal end by a distance. Owen et al., however, is silent as to precise value of the distance being shown, relative to the diameter of the

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leg 71 of the primary cyclone 65. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select an appropriate distance (such as the recited range) relative to the diameter of the leg 71 of the primary cyclone 65 in the modified apparatus of Owen et al., on the basis of suitability for the intended use and absent showing any unexpected results, because changes in dimension merely involves ordinary skill in the art. *In re Rose*, 220 F.2d 459, 463, 105 USPQ 237, 240 (CCPA 1955), and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Owen et al. (US 3,821,103) in view of Jones (US 2,634,191), as applied to claim 1 above, and further in view of Danielsen et al. (U.S. 4,996,028).

The collective teaching of Owen et al. and Jones is silent as to the specifically recited ratio of radius-to-diameter for the single leg termination. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select a ratio of 1.0 to 3.0 for the ratio of radius-to-diameter for the single leg termination in the modified apparatus of Owen et al., since the specific ratio is not considered to confer patentability to the claim since the precise ratio would have been considered a result effective variable by one having ordinary skill in the art. Accordingly, one having ordinary skill in the art would have routinely optimized the ratio of radius-to-diameter in order to obtain a desired solids level within the cyclone diplegs, *In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980), and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Danielsen et al. is

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further provided to evidence the conventionality of providing a single leg termination to the distal end of a cyclone dipleg according to the recited configuration, wherein, "... the radius of curvature of the tubular body portion 25 preferably is in the range of from *about 1 1/2 times to about 2 1/2 times* the diameter of the tubular body portion 25." Maintaining a pre-determined, sufficient, radius of curvature increases, under conditions of use, the stability of the dipleg solids level over that of diplegs having straight run tubular body portions, as taught by Danielson. (column 3, lines 2-10; FIG. 1-2).

9. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Owen et al. (US 3,821,103) in view of Jones (US 2,634,191), as applied to claim 1 above, and further in view of Luckenbach (U.S. 4,074,691).

Regarding claim 4, the collective teaching of Owen et al. and Jones is silent as to the radius curve termination of the cyclone leg (e.g., the bend 20 shown in FIG. 1 of Jones) being constructed from a succession of straight tube sections arranged in an arcuate array. In any event, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select such a construction for the radius curve termination in the modified apparatus of Owen et al., on the basis of suitability for the intended use and absent showing any unexpected results thereof, because the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). To evidence the conventionality of such a leg termination construction, Luckenbach (FIG. 1) teaches a cyclone comprising a dipleg 16 having a leg termination constructed of a pair of interconnected angularly disposed conduit members 12 and 14, the upper

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one of which is lineal and connected with the lower vertical portion of the cyclone dipleg 16.

Regarding claim 5, as modified above, the radius curve at the end of the cyclone leg in the modified apparatus of Owen et al. inherently directs the flow of descending mass of solids into a plane orthogonal to the ascending gaseous flow, by virtue of the total angle subtended by the radius curve.

Response to Arguments


10. Applicant's arguments with respect to claims 1 and 3-6 have been considered but are moot in view of the new ground(s) of rejection.

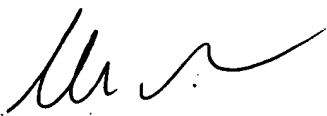
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jennifer A. Leung
May 24, 2006 


Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700